

# PATENT SPECIFICATION

DRAWINGS ATTACHED

921567



Date of Application and filing Complete Specification: Dec. 5, 1961.

No. 43412/61.

Application made in Switzerland (No. 13626) on Dec. 6, 1960.

Complete Specification Published: March 20, 1963.

Index at acceptance:—Class 65(2), F1K1B, F3A (1:2:4), F3M (1:4:5), F3R.

International Classification:—E05d.

## COMPLETE SPECIFICATION

### Improvements in or relating to Adjustable Door Hinges

We, "THERMA" A.G., a Body Corporate, organised under the laws of Switzerland, of Schwanden, Glarus, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

- The present invention relates to door hinges and, in particular, to an adjustable door hinge for a cupboard or cabinet, comprising a hinge guide member adapted to be fixed to the cupboard casing and a hinge part engaging the hinge guide member, said hinge part being provided with adjusting members operative to change the position of the door relatively to the guide member.
- Usually, when a door is attached to a cupboard, the door hinges are fixed in a determined position with respect to the cupboard casing. It is then difficult and only possible in a limited degree to change the position of the door. Particularly with cupboards having large front surfaces and divided in several sections having a plurality of doors disposed at small distances from each other, it is not possible, or only at a great expenditure of time, to adjust the positions of the doors so that all door interspaces will be equal and uniform.
- Moreover, during the use of a cupboard, a certain displacement of the doors may be produced which requires a readjustment. The fixing of the hinges to the cupboard requires a considerable amount of work, as the positioning of the door with respect to the cupboard must be determined in three directions. This is carried out in the easiest way with hinges which are fixed on the front surface of the cupboard. The fact that a portion of the hinge is protruding from the front surface of the cupboard or, if the mounting is countersunk, the additional work required represents a drawback. It is difficult to fix the hinges to an inner surface of the cupboard, because in fixing the hinges, the door must be kept open so that the closed door position in the moment of fixing of the door cannot be checked.

Several types of adjustable door hinges are  
[Pri]

known which only permit an adjustment in a single direction horizontally or vertically. Known hinges which allow for adjustment in two directions are very complicated and expensive. The hinge parts are adjustable along slots and are fixed by screws in the adjusted position.

Other hinge constructions are provided with adjustment means which are visible from the outside when the door is closed, resulting in an unfavorable appearance of the cupboard. Adjustable hinges which protrude from the cupboard casing or from the door are disadvantageous, as a joining of several similar cupboards at a small distance one from the other is then not possible. Other known hinge structures allow for adjustment in two directions; however, in order to effect an adjustment the doors must be removed from the cupboard.

The object of the invention is to provide an improved adjustable door hinge which avoids the above mentioned drawbacks. According to the invention, the door hinge comprises a tubular hinge guide member, a relatively movable hinge part having a section penetrating into said guide member, said section having an enlarged front portion, a front screw engaged in the hinge part to adjustably support the hinge part in the vertical direction relatively to said guide member, a rear screw engaged in said hinge part and coacting with said enlarged front portion for adjustably supporting said hinge part in the horizontal direction relatively to said guide member, the two adjusting screws being adapted to be accessible from the inside of the cupboard or cabinet, when the guide member is fixed thereto through openings provided in said guide member for effecting a horizontal and/or vertical adjustment of the hinge part.

This structure serves to bring the door during its mounting and any time afterwards into the correct position with respect to the cupboard casing, and to adjust the spacing of adjacent doors when a cupboard front is provided with a plurality of doors.

The novel features of the invention together

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with further of its advantages will become apparent from the several embodiments thereof shown by way of example in the accompanying drawings and described in the following specification.

In the drawings:

Figure 1 is a view in elevation of a cupboard front having seven doors;

Figure 2 a plan view of an adjustable hinge according to the invention

Figure 3 a sectional view on the line III—III of Figure 2;

Figure 4 is a side view of Figure 2;

Figure 5 a sectional view of the mounting of an adjustable hinge on thin-walled cupboards;

Figure 6 a sectional view of the mounting of an adjustable hinge on thick-walled cupboards, and

Figure 7 a sectional view of the mounting of an adjustable hinge without screws in thick-walled cupboard corners.

Figure 1 of the drawings represents a cupboard front having seven doors 1 which are mounted by means of hinges to the cupboard or cabinet casing, uniform spaces 2 being provided between the edges of adjacent doors. The axes of the hinges are designated by 3 and the door handles by 4. The portion D of Figure 1 is shown in greater detail in Figures 2 to 7.

According to Figures 2 to 4, a prismatic tubular hinge guide member 7 is provided with two studs 8 which are received in appropriate bores 9 of the cupboard floor 6. The member 7 is also fixed by means of a screw 10 to the cupboard side wall 5. A hinge part 11 penetrates into the tubular guide member. The diameter of the square portion of this hinge part penetrating into the tubular member is smaller than the internal diameter of the member 7, so that there is a clearance between the hinge part and the member 7. The extended front end of the part 11 carries the door 1 by means of a hinge pin 3. The hinge part 11 is retained in the member 7 by a spring clamping pin 12 which is clamped in a hole of the hinge part 11 and engages slots 12<sup>a</sup> of the guide member 7 in such a manner that the hinge part 11 is adjustable in horizontal and in vertical direction. A vertical screw 13 is screwed into an enlarged front portion 11a of the section of the hinge part 11 penetrating into the guide 7, and a horizontal screw 14 is screwed into the rear end of the hinge part 11. The length of these screws 13, 14 corresponds to the inner width of the tubular guide member 7, so that they rest with both their end faces against opposite walls of the guide member 7. The width of the enlarged front portion 11a also corresponds to the inner width of the tubular guide member. When turning one or the other of the two screws, a corresponding movement of the hinge part 11 will result and accordingly an adjustment of

the position of the hinge pin 3 can be obtained. Each screw 13, 14 has an inner hexagon 15, or a screw driver slot which is accessible through a hole 15a in the hinge guide member 7 by means of a hexagonal wrench or a screw driver. In order to lock the screws 13, 14 against any undesired rotation, three spring pins 16 are clamped in holes in the hinge part 11 and pressed against the circumference of the screws 13, 14 as shown in Figures 3 and 4.

The hinge shown in Figures 2 to 4 permits the fixing and the adjustment of a door as follows:

The studs 8 of the hinge guide member 7 are introduced into appropriate holes 9 of the cupboard and the screw 10 is screwed into the side wall 5. Thus, two hinge guide members 7 are fixed, one to a lower and one to an upper corner of the cupboard casing. Then the hinge parts 11 are mounted on the cupboard door 1 by introducing the hinge pins 3. The screws 13 and 14 are already screwed into the hinge part 11. Thereupon, the two hinge parts 11 mounted at the top and the bottom of the door are pushed into the corresponding hinge guide members 7, the spring clamping pin 12 retaining the hinge part 11 in the guide member 7 is then inserted. Now it is possible to adjust the door 1 with respect to the cupboard casing in a vertical direction by a turning of the screw 13 and in a horizontal direction by turning the screw 14. Thus, when mounting a plurality of doors to a cupboard front as shown in Figure 1, the distance 2 between the doors can be adjusted to be uniform for the entire cupboard front. The mounting of the doors in this manner is very easy and can be obtained at low cost. As shown in Figures 2 and 3, the hinge guide member 7 is symmetrical with respect to its vertical median plane, thus making it possible to use the same hinge guide member in the upper or in the lower part as well as at the left or at the right side of the cupboard. If two hinges are used for each door it is possible, in order to facilitate the adjustment, to introduce a vertical screw 13 only into one of the two hinges.

Figure 5 shows the fixing of a hinge guide member 7 in a thin-walled cupboard casing. The studs 8 are not longer than the wall thickness of the cupboard floor 6. Further a boss 5<sup>a</sup> is provided in the wall 5 into which the screw 10 is screwed in such a manner that it does not protrude from the cupboard casing. No spring pins are provided for locking the screws 13 and 14, but the screws are somewhat longer than the inner diameter of the tubular hinge guide member 7, which is formed of resilient material. The screws are therefore elastically clamped in the assembled state between two opposite side walls of the tubular guide member, thus preventing the screws from being accidentally turned.

Figure 6 shows the fixing of a hinge guide

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member 7 to a relatively thick side wall 5 of the cupboard. The studs 8 engage holes 9 of the side walls, and two fastening screws 10 are screwed into the side wall.

- 5     Figure 7 shows the fixing of a hinge guide member 7 to a thick-walled cupboard corner without using screw means. The studs 8 are driven by force into appropriate holes 9 of the wall 6 and retained therein by a frictional engagement.

10    For retaining the hinge part 11 in the hinge guide member 7 a screw or a cotter pin may also be used instead of the spring pin 12.

WHAT WE CLAIM IS:—

- 15    1. An adjustable door hinge for cupboards or cabinets, comprising a tubular hinge guide member, a relatively movable hinge part having a section penetrating into said guide member, said section having an enlarged front portion, a front screw engaged in the hinge part to adjustably support the hinge part in the vertical direction relatively to said guide member, a rear screw engaged in said hinge part and coacting with said enlarged front portion for adjustably supporting said hinge part in the horizontal direction relatively to said guide member, the two adjusting screws being adapted to be accessible from the inside of the cupboard or cabinet, when the guide member is fixed thereto, through openings provided in said guide member for effecting a horizontal and/or vertical adjustment of the hinge part.
- 20    2. An adjustable door hinge as claimed in claim 1, in which said two screws are somewhat longer than the inner width of said hinge guide member, which is formed of resilient

material and are secured by the resulting clamping action against any undesired rotation.

- 40    3. An adjustable door hinge as claimed in claim 1, in which retaining means for holding the hinge part in said guide member are provided and are formed by a spring clamping pin, a screw or a cotter pin inserted into the hinge part.

45    4. An adjustable door hinge as claimed in claim 1, in which said hinge guide member is adapted to be fixed to the cupboard side wall by means of screws.

- 50    5. An adjustable door hinge as claimed in claim 1, in which said hinge guide is provided with studs adapted to engage appropriate bores provided in the cupboard top and bottom walls.

55    6. An adjustable door hinge as claimed in claims 1 and 5, in which said hinge guide member, in addition to said anchoring studs, is provided with means for fixing it to the side wall of the cupboard.

- 60    7. An adjustable door hinge as claimed in claim 1, in which said hinge guide member is symmetrically formed with respect to a vertical median plane, thus permitting the positioning of said member at the top or bottom, as well as at the right and at the left side, of a cupboard.

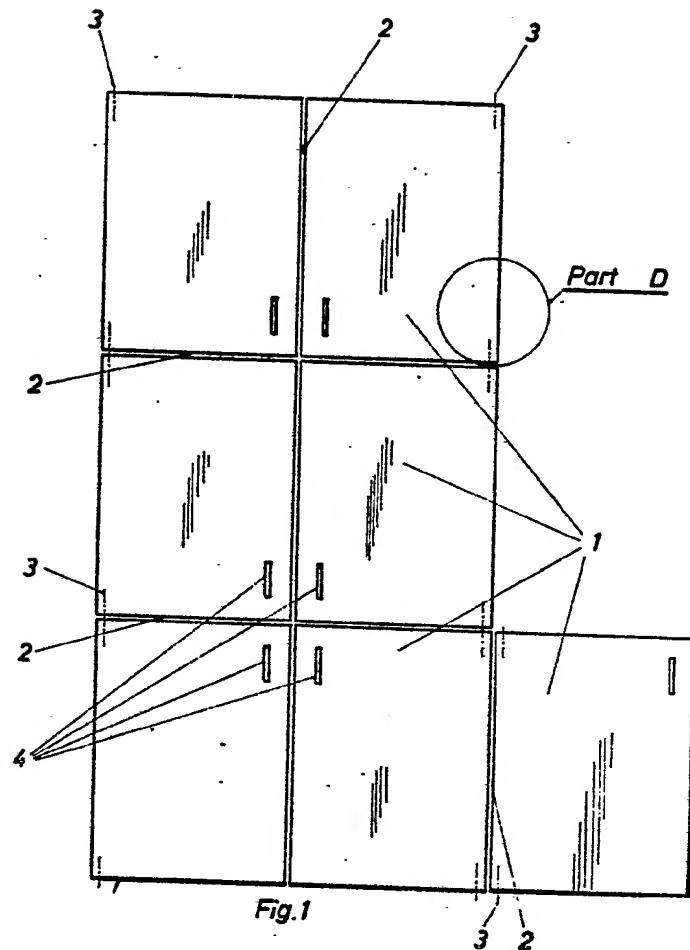
65    8. The improved door hinge for cupboards or cabinets, substantially as described and as illustrated in the accompanying drawings.

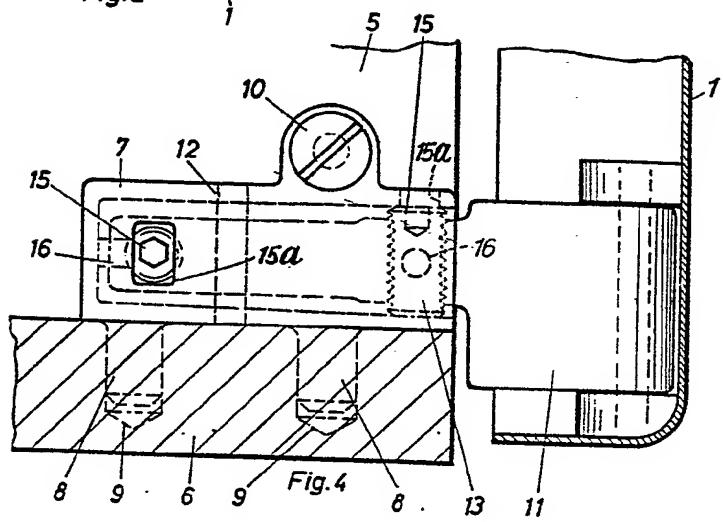
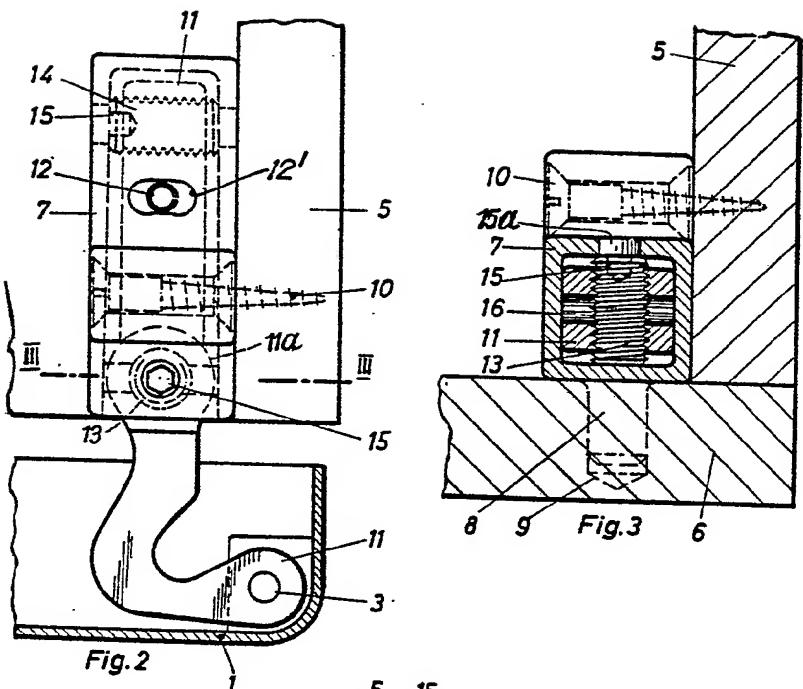
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Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press  
(Leamington) Ltd.—1963. Published by The Patent Office, 25 Southampton Buildings,  
London, W.C.2, from which copies may be obtained.

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3 SHEETS    *This drawing is a reproduction of  
the Original on a reduced scale*  
                 Sheet 1





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COMPLETE SPECIFICATION

3 SHEETS

*This drawing is a reproduction of  
the Original on a reduced scale*

Sheets 2 & 3

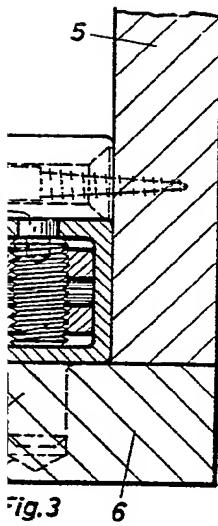


Fig. 3

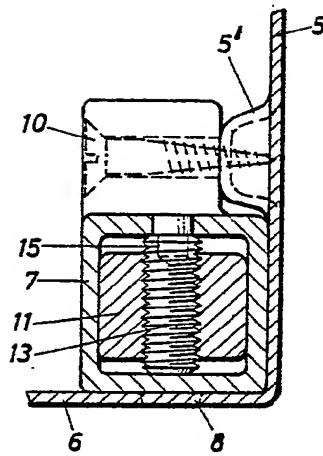


Fig. 5

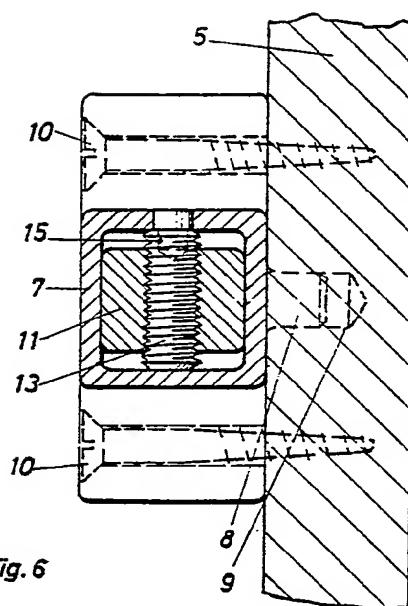


Fig. 6

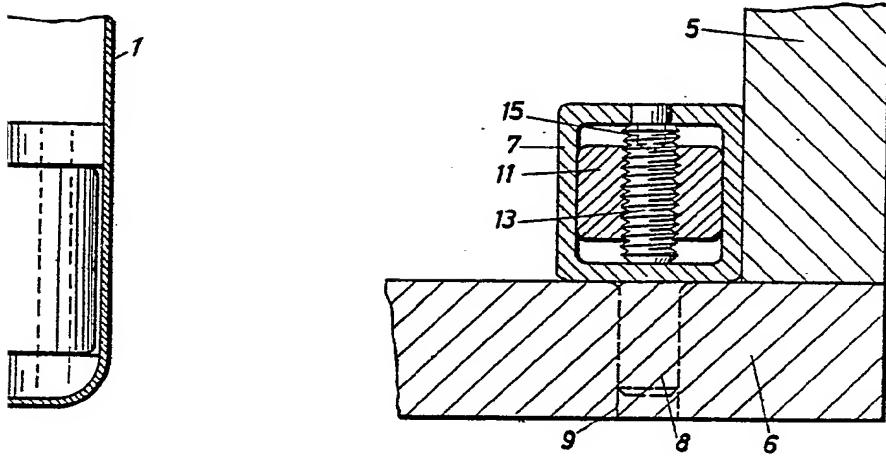


Fig. 7

921567 COMPLETE SPECIFICATION  
3 SHEETS This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 2 & 3

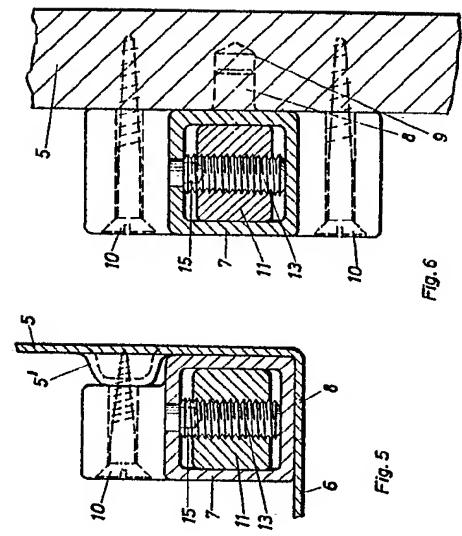


FIG. 6

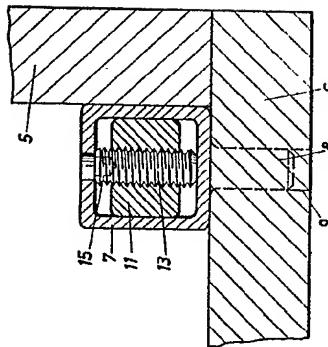


Fig. 7

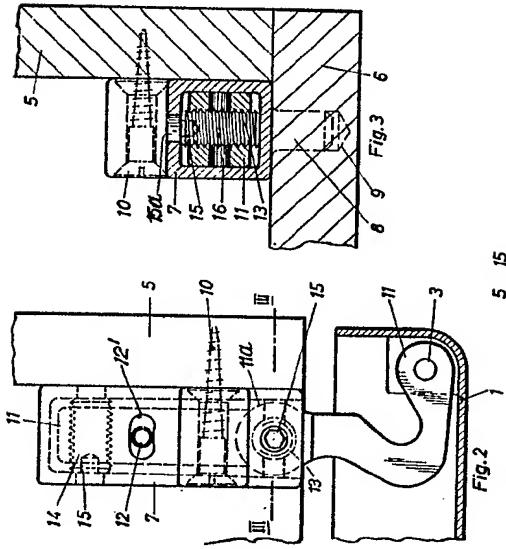


Fig. 2

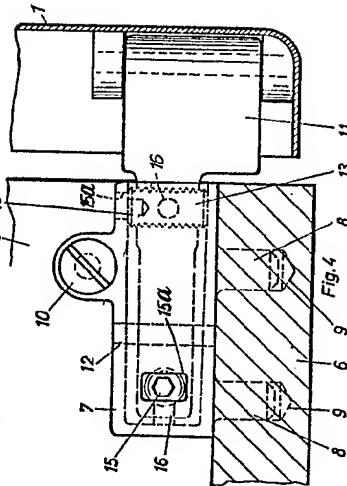


Fig. 4